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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/699,061

10/31/2003

Ben D. Roberts

ITL.103US (P17101)

2582

7590

05/04/2005

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EXAMINER

TRA, TUYEN Q

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 05/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b> 10/699,061	<b>Applicant(s)</b> ROBERTS	
	<b>Examiner</b> Tuyen Q. Tra	<b>Art Unit</b> 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6-8, 11, 12, 14, 16-18, 21, 24, 26, 27, 29-31 and 33 is/are rejected.
- 7) ☒ Claim(s) 3, 5, 9, 10, 13, 15, 19, 20, 23, 25, 28 and 32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0305</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### **Specification**

#### **Arrangement of the Specification**

1. As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

2. Application is missing "SUMMARY OF THE INVENTION"

#### **Claim Rejections - 35 USC § 102**

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 7, 11, 17, 21 and 27 are under 35 U.S.C. 102(b) as being anticipated by Ernstoff et al. (U.S. Pat. 5,903,323 A).

a) With respect to claims 1 and 11, Ernstoff et al. discloses a full color sequential image projection system incorporating time modulated illumination in Figure 1 comprising of a mirror array (item 15) to form a projected image comprising pixels; and a circuit (item 20) to, for each pixel, control the mirror array to selectively direct reflected light to combiner (lens17) from at least two mirrors of the array to regulate an intensity of the pixel (col. 5, lines 1-7).

b) With respect to claims 7, 17 and 27, Ernstoff et al. further discloses wherein a different dimension of the array is associated with pixel positions of projected image.

c) With respect to claim 21, Ernstoff et al. discloses a full color sequential image projection system incorporating time modulated illumination in Figure 1 comprising of condensing optics, a mirror array (item 15) comprising pixels, a dimension of the array being associated with intensity values of the pixels; and a circuit (item 20) to, for each pixel, control the mirror array to selectively direct reflected light from the mirror array into the condensing optics from at least two mirrors of the array to regulate an intensity of the pixel (col. 5, lines 1-7)

### **Claim Rejections - 35 USC § 103**

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 4, 6, 8, 11, 12, 14, 16, 18, 21, 22, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandinger et al. (U.S. Pat. 6,605,796 B2) in view of Berlin (US Patent 5,815,303 A).

a) With respect to claims 1 and 11, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a mirror array to form a projected image comprising pixels, and a circuit to, for each pixel, control the mirror array to selectively combine reflected light from at least two mirrors of the array to regulate an intensity of the pixel (see below Figures).

However, Brandinger et al. does not implicitly disclose a first dimension of the array being associated with intensity value for the pixels. Within the same field of endeavor, Berlin discloses a fault tolerant projective display having redundant light modulators with teaching of a first dimension (i.e. column or row) of the array being associated with intensity value for the pixels (col. 8, line 34-36).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct a projected system such as disclosed by Brandinger et al., and with a column/row of the array being associate with intensity value of the pixels such as discloses by Berlin for purpose of achieving gray scale intensity variations.

b) With respect to claim 21, Brandinger et al. discloses in Figure 8D comprising of condensing optics, a mirror array; and a circuit to, for each pixel, control the mirror

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array to selectively direct reflected light from the mirror array into the condensing optics from at least two mirrors of the array to regulate an intensity of the pixel (Figure 1 illustrated an controller for DMD as an computer controller, col. 5, lines 5-9 discloses purpose of modulating intensity of mirror pixels).

c) With respect to claims 2, 12 and 22, Brandinger et al. further discloses in Figure 8D wherein, for each pixel, the circuit controls the mirror array to selectively tilt the at least two mirrors to reflect light into an optical path that intersects a location of the pixel to regulate the intensity of the pixel.

d) With respect to claims 4, 14 and 24, Brandinger et al. further discloses in Figure 8D wherein each pixel of the projected image is uniquely associated with at least two mirrors of the array.

e) With respect to claims 6, 16 and 26, Brandinger et al. further does not discloses the use of pulse width modulation to regulate the intensity of each pixel.

f) With respect to claims 8 and 18, Brandinger et al. further discloses in Figure 8D wherein optics to, for each pixel, merge optical paths extending from said at least two mirrors into a single optical path that intersects a location of the pixel.

7. Claims 29-31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstoff et al. (U.S. Pat. 5,903,323 A), in view of Berlin (US Patent 5,815,303 A) and further in view of Hewlett (U.S. 6,771,411 B2).

a) With respect to claims 29-31, Ernstoff et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a mirror array to form a projected image comprising pixels, and a circuit to, for each pixel, control the

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mirror array to selectively combine reflected light from at least two mirrors of the array to regulate an intensity of the pixel (col. 5, lines 1-7)..

However, Ernstoff et al. does not implicitly disclose a first dimension of the array being associated with intensity value for the pixels. Within the same field of endeavor, Berlin discloses a fault tolerant projective display having redundant light modulators with teaching of a first dimension (i.e. column or row) of the array being associated with intensity value for the pixels (col. 8, line 34-36).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct a projected system such as disclosed by Brandinger et al., and with a column/row of the array being associate with intensity value of the pixels such as discloses by Berlin for purpose of achieving gray scale intensity variations.

The teachings of Ernstoff et al. in view of Berlin are described with reference to above. However, Ernstoff et al. and Berlin does not disclose a processor coupled to the mirror array and a flash memory storing instructions for processor to control the mirror array. Within the same field of endeavor, Hewlett teaches a programmable light beam shape altering device using programmable micromirrors with teaching of a processor and a flash memory for storing instructions for the processor to control the mirror array (see Figure 5).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the acoustic imaging apparatus with mirror array such as disclosed by Ernstoff et al. and Berlin, with a processor and a flash

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memory used for storing instruction to control the mirror array such as discloses by Hewlett for purpose of controlling mirror array therein the image display.

b) With respect to claim 33, Ernstoff et al. further discloses wherein a different dimension (i.e. a row of the array) of the array is associated with pixel positions of projected image.

### **Allowable Subject Matter**

8. Claims 3, 5, 9, 10, 13, 15, 19, 20, 23, 25, 28 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The reason for the indication of allowable subject matter is that (claims 3, 13, 23) wherein, for each pixel, the circuit controls the mirror array to cause a greater number of said of at least two mirrors to reflect light into the optical path for a higher intensity level than a number of said of at least two mirrors that reflect light into the optical path for a lower intensity level; (claims 5, 15, 25) each pixel of the projected image is associated with a number of mirrors of the array substantially equal to the number of potential gray levels of the pixel; (claims 9, 19) the optics compresses a two-dimensional image formed from light reflected from the mirror array into a one-dimensional sub-image of the projected image; (claims 10, 20, 28) for each pixel, the intensity of the pixel is indicated by a multiple bit digital value and mirrors of the array are organized into different groups, each group of minors being associated with a different bit of the digital value; (claim 32) an instructions to cause the processor to group mirrors of the array



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into groups of multiple mirrors, each group being associated with a different pixel of the projected image and the mirrors of each group collectively forming a gray scale intensity for the associated pixel disclosed in the claims is not found in the prior art.

### RESPONSE TO APPLICANT 'S ARGUMENT

9. Applicant's arguments filed 03/21/2005 have been fully considered but they are not persuasive. Applicant argument as follow:

a) "Contrary to the limitations of amended independent claims 1 and 21, none of the cited references teaches or suggests the circuit that controls the number of mirrors that reflect light into an optical path based on an intensity for a pixel." In Remark, page #8, lines 17-19.

b) Ernstoff discloses a pulse width modulation technique to control the intensity of a pixel and does not teach or suggest controlling the number of mirrors to control the pixel intensity, as set forth in amended independent claim 11. In Remark, page #10, lines 1-4.

With respect to applicant 's argument a) and b), the examiner disagrees because Ernstoff et al. discloses in column 5, lines 1-7 "A timing and control circuit 20 specifies and coordinates the changes in the intensity of the light source 12 in synchronism with the data input signals 23 to the DMD as discussed more fully below. *The timing and control circuit effect the selective activation of the DMD elements as necessary to provide the desire gray scale intensity for each pixel on the screen 21*" which shows the circuitry has been used in selecting a number of mirror elements in order to provide the gray scale intensity for each pixel. In addition, applicant fails or not clearly show a circuit where it controls the number of the mirrors.

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Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

### Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (571) 272-2343. The examiner can normally be reached on Monday to Thursday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (571) 272 - 2328. The fax number for this Group is (703) 872-9306.

tt

April 30, 2005

  
Hung Xuan Dang  
Primary Examiner